

Portola Contingency

- 1) PM2.5 emission reductions achieved from the implementation of the Woodstove Change-out Program (Change-out Program) through 12/31/2018 are equivalent to 0.0465 tpd.¹
- 2) Additional reductions need to reach attainment level PM2.5 emissions could be achieved by changing out 184 more devices.

Table 1. Estimated future emission reductions needed for attainment.

Old Device	New Device	Emission Rate	New Device EF (lb/ton)	Number of Devices	Emissions (ton/year)			Emission Reductions (tpd)
					Before	After	Difference	
Uncertified	Wood (by	2.80	5.6	60	4.1053	0.5966	3.5087	0.0096
Uncertified	Wood	2.00	4	119	8.1422	0.8452	7.2970	0.0200
Uncertified	Non-wood	0.00	0	5	0.3421	0.0000	0.3421	0.0009
Total				184	12.5896	1.4418	11.1477	0.0305

- 3) Change-out Program is implemented in two zones. Zone 1 encompasses the City of Portola and Zone 2 encompasses the Nonattainment Area outside of the City limits.
- 4) Table 2 shows the number of uncertified devices remaining in operation in each zone after the attainment year.

Status	Nonattainment Area		Zone 1		Zone 2	
	Uncertified Stoves	Fireplaces	Uncertified Stoves	Fireplaces	Uncertified Stoves	Fireplaces
Operating before Change-out Program	711	139	305	60	406	79
Replaced through 12/31/2018	269	12	161	6	108	6
Additional needed for attainment*	184	0	110	0	74	0
Total needed for attainment	453	12	271	6	182	6
Remaining in operation after the attainment year	258	127	34	54	224	73

- 5) City of Portola Ordinance will apply only to Zone 1 (34 woodstoves and 54 fireplaces).
- 6) Based on the historical data, contingency provision of the Ordinance is estimated to apply on 31% of days annually.
- 7) The first year the mandatory woodburning curtailment will be in effect, 2021, compliance rate was estimated at 25% and the estimated reductions were calculated as follows.

¹ Documented in 2019 Milestone Report and 2018 Enforceable Commitment Report

Category	Stove	Fireplace	Total
Emission Factor (lb PM2.5/ton of wood)	30.6	34.6	
Wood use annual (cords)	4.3	6	
Wood density (ton/cord)	1.04	1.04	
Conversion from lb to ton	2000	2000	
Number of Devices	34	54	88
Emissions (tpy)	2.3292	5.7927	8.1220
Emissions (tpd)	0.0064	0.0159	0.0223
25% compliance on 31% of days	0.0005	0.0012	0.0017

- 8) The compliance was estimated to increase to 50% during the second year of mandatory woodburning curtailment.
- 9) The difference between the reductions at 50% compliance and 25% compliance was attributed to contingency provision of woodburning curtailment.
- 10) Additional emission reductions are estimated to be achieved from ongoing implementation of the Change-out Program.
- 11) In order to provide a conservative estimate, we assumed that the rate of implementation was reduced to 25% in Zone 1 and 50% in Zone 2. (The difference is due to the number of remaining uncertified devices).

Year	Zone 1			Zone 2		
	Woodstoves	Fireplaces	Total	Woodstove	Fireplaces	Total
Change-outs through 2018						
2016	80	0	80	31	0	31
2017	44	0	44	41	0	41
2018	43	6	49	30	6	36
Avg Rate of Replacement	44	6	50	34	6	40
Uncertified devices remaining in operation after attainment						
2022	34	54	88	224	73	297
Continuation of Change-out Program after Attainment						
Average replacement rate reduced to 25% in Zone 1 and 50% in Zone 2						
2022	11	2	13	17	3	20

1. Assuming that ongoing change-outs in Zone 1 will continue at the 25% of the rate observed between 2017 and 2018

Old Device	New Device	Emission Rate	New Device EF (lb/ton)	Number of Devices	Emissions (ton/year)			Emission Reductions (tpd)
					Before	After	Difference	
Uncertified wood	wood	2	4	11	0.7526	0.0781	0.6745	0.0018
Fireplace wood	wood	2	4	2	0.2159	0.0142	0.2017	0.0006
Total					0.9685	0.0923	0.8762	0.0024

2. Assuming that ongoing change-outs in Zone 2 will continue at the 50% of the rate observed between 2016 and 2018

Old Device	New Device	Emission Rate	New Device EF (lb/ton)	Number of Devices	Emissions (ton/year)			Emission Reductions (tpd)
					Before	After	Difference	
Uncertified	wood	2	4	17	1.1632	0.1207	1.0424	0.0029
Fireplace	wood	2	4	3	0.3239	0.0213	0.3025	0.0008
Total					1.4870	0.1421	1.3450	0.0037

12) Additional reductions will also be achieved by 3% estimated compliance with the voluntary woodburning curtailment in Zone 2.

Estimating Benefits of Voluntary Woodburning Curtailment in Zone 2

Assume 3% of households will comply with curtailment

Category	Stove	Fireplace	Total
Emission Factor (lb PM2.5/ton of wood)	30.6	34.6	
Wood use annual (cords)	4.3	6	
Wood density (ton/cord)	1.04	1.04	
Conversion from lb to ton	2000	2000	
Number of Devices	224	73	297
Emissions (tpy)	15.3235	7.9172	23.2407
Emissions (tpd)	0.0420	0.0217	0.0637
3% compliance on 31% of days	0.0004	0.0002	0.0006

13) The total estimated reductions are presented in the table below.

Category	2021	2022
Inventory in Plan	0.4863	0.4866
Change-outs (2019-2021 Avg)	-0.062	-0.062
Mobile source reductions	-0.0003	-0.0001
Open burning reductions	-4.2921E-05	-4.2921E-05
Curtailment (25% compliance)	-0.0017	-0.0017
Updated inventory after controls	0.4222	0.4227
Reductions from Contingency Measure (CM)		
Curtailment (25% increase from 2021 to a total compli		-0.0017
Ongoing Implementation of Change-out Program		
Change-outs Zone 1		-0.0024
Change-outs Zone 2		-0.0037
Other Reductions		
Voluntary curtailment in Zone 2 (3% compliance)		-0.0006
Total Reductions		-0.0084
Inventory Impact		
2021 Updated inventory after controls but before CM		0.4222
2022 Inventory after CM		0.4143
Change in inventory		0.0079